

## **APPENDIX C1: Working Group Comments**

The Working Group discussed the recreational data presented and questioned how 8800 trips could only catch 90 tilefish. It was noted that many tuna trips will fish for tilefish and may have listed tilefish as a secondary target. A request was made to limit the data to only trips that caught tilefish and trips that reported tilefish as a primary target. This reduced the number of trips to 2004. It was decided that the number of trips was not very meaningful given that tilefish catch in the recreational fishery appears to be a sporadic event. The recreational catch is currently not directly incorporated into the assessment but may become more of an issue as the stock recovers.

The Working Group discussed the CPUE series and decided to use the data as three separate series. The Turner series was estimated using different methodology than the later data. The weighout series and the VTR series were derived using the same methodology but the data in each part were collected in a different way. Looking at the vessels that have been in the fishery over time was very useful in the decision to keep the two series separate. Prior to 1994, vessels from New York were not in the weighout database individually. After 1994, they reported through the VTR system.

There were also concerns from the Working Group over changes in gear technology and fishing behavior over the time of the assessment. These changes may mask changes in abundance.

The Working Group reviewed several formulations of the ASPIC model. The group decided to use CPUE as three series and start the model in 1973. The formulations with the longer time series did not add anything to the more recent time frame. The group decided to fix the B1 ratio at 1 because the stock was not likely at carrying capacity in 1973 as the fishery had been occurring since 1916.

The Working Group reviewed two other models that gave slightly more optimistic views of the status of the stock, the AIM model and the LRSR model. Both models were promising for this stock but used a single CPUE series. The time trend of the LSRG model was similar to that of the ASPIC model run with a single CPUE series.

A Catch-at-length model was presented to the Working Group. The assumption of constant recruitment was discussed and may be a possible reason that the model does not fit the data very well and results in a spike of fishing mortality at the end of the time series. From the simulation work, an increase in fishing mortality can occur if you have both an increasing trend in fishing mortality and an increasing trend in recruitment. The length frequencies in the catch may or may not be an accurate reflection of the population length frequency, but may have more to do with fishing practices to maximize profit. The trawl length composition is not included in the model and may contribute to the lack of fit. Trawl catches of tilefish are generally smaller than those of longlines.

A length-based yield-per-recruit model was examined which confirmed a previous age-based YPR. The partial recruitment (PR) vector used may or may not reflect the fishery PR. If the fishery PR is dome-shaped then  $F_{\max}$  may come closer to the  $F_{\text{msy}}$  of the ASPIC model. The PR

may also be changing from year to year based on market considerations. A bio-economic model that maximizes economic yield per recruit may be a useful tool.

The Working Group noted several signals coming out of the data. The current length frequency of the commercial catch is truncated relative to the 1970s length frequencies, but they were never as wide as expected from the maximum size of tilefish. The trawl catches are increasing, which may either be a sign of increased recruitment or increased allocation in recent years. The landings by vessels directing for tilefish have seen an increase in large animals indicating good stock size. Most of the models presented show some increase in biomass in recent years. Areas with increased amounts of offshore lobster gear may have created closed areas and refuges for the larger animals.

The Working Group discussed the uncertainty in the projections and whether to use the bias-corrected estimates or the ordinary estimates. It was decided to use the ordinary estimates for two sets of projections. The first would be a status quo catch of 905 mt and the second would be 905 mt for 2005 and then a constant catch that would allow the stock to recover to  $B_{msy}$  by 2011. Discussion also occurred as to the unusual erratic behavior of this particular projection. It may be that the large increase in CPUE in the last two years is causing the model to have more uncertainty causing a large estimate of bias. It was suggested to try starting the model projections at 2002. The Working Group considered these projections to be too uncertain to form the basis of TAC advice.

## **Research Recommendations**

Research Recommendations from 1998 Science and Statistical Committee review

- 1) Ensure that market category distributions accurately reflect the landings.
- 2) Ensure that length frequency sampling is proportional to landings by market category.
- 3) Increase and ensure adequate length sampling coverage of the fishery
- 4) Update age- and length-weight relationships.
- 5) Update the maturity-at-age, weight-at-age, and partial recruitment patterns.
- 6) Develop fork length to total length conversion factors for the estimation of total length to weight relationships
- 7) Incorporate auxiliary data to estimate  $r$  independent of the ASPIC model.

The Working Group noted that sampling has improved for 2003 and 2004. This addresses 1, 2, and 3. A hook selectivity study is planned for 2005-2006 and data will be collected to address 4 and 5. Work is in progress collecting total length and fork length data to address 6. Nothing has been done to date to address 7.